Climate Science and Economic Risk in the Financial Services

Workshop hosted by NOAA and Liberty Mutual Insurance

On October 5, 2021, **NOAA** and **Liberty Mutual Insurance** hosted a **virtual workshop** to explore challenges and opportunities related to climate and resilience risk. Government officials, climate experts, other scientists, and insurance, reinsurance, and finance industry professionals engaged in a multifaceted conversation about the state of the science, physical risks, transition strategies, climate data and community impacts of climate change.

The **IPCC Working Group 1 Contribution to the Sixth Assessment Report** highlighted the need to immediately reduce emissions to mitigate accelerating changes in the world's climate. The financial sector has a key role to play in supporting innovation and in financing the transition to a low carbon economy. However, policy and action need to be informed by an understanding of the availability, utility and interpretation of climate data as well as the interconnectedness of financial ecosystems.

Liberty Mutual INSURANCE

Climate resilience challenges and opportunities

Don Graves, Deputy Secretary of Commerce, U.S. Department of Commerce, provided opening remarks and stressed that the Biden Administration is prioritizing tackling the climate crisis by taking **several actions** including rejoining the Paris Climate Accords, building a roadmap to achieve a 52% reduction in greenhouse gas emissions by 2030, achieving net-zero emissions by 2050, and developing a **Clean Tech Export Competitiveness Strategy**. Graves concluded his remarks by stressing that strong partnerships are needed to address the climate crisis while leading the world toward a clean energy future that will create millions of jobs.

Participants then heard from **Richard W. Spinrad, Ph.D**., Under Secretary of Commerce for Oceans and Atmosphere and NOAA Administrator, who stated that one of his top priorities is to emphasize NOAA's role as the primary authoritative provider of federal climate science, products and services. He also spoke to the need to ensure that equity is embedded in everything NOAA does, and for NOAA to better engage with stakeholders in creating and delivering equitable climate services and products.

James M. MacPhee, Executive Vice President; President, Global Retail Markets, Liberty Mutual Insurance, concluded the opening sessions by describing how the insurance industry prices policies based on a thorough assessment of risk, and climate change is significantly impacting this risk, no matter where people live. He stressed that the decisions federal, state and local governments make prioritizing resilience will have repercussions for decades to come. He concluded with a call to action that now is the time to invest in climate mitigation and build more resilient communities to save lives and support communities' long-term economic viability.

View Workshop Session Videos

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Key Climate Information

NOAA Climate.Gov - provides science and information for a climate-smart nation.

National Centers for Environmental Information - access to comprehensive oceanic, atmospheric, and geophysical data.

The Climate Explorer - explore how climate is projected to change in your county.

Panel on Climate Risk Modeling and Gaps in Climate Data

This panel focused on the current state of climate risk modeling (catastrophe and climate models), and explored what aspects of climate modeling and forecasting are known and what scientific data can be incorporated into catastrophe models to make them more suitable to assess future risks. Panelists explained how catastrophe models have been used for approximately the last 30 years by the insurance industry to assess risk from extreme events (e.g., Hurricane Andrew, Northridge earthquake) when it became clear that insurers could no longer rely on just looking at historical events to effectively assess risk.

The panelists then provided a primer on how climate models work and discussed the key differences between catastrophe and climate models. They reviewed a recent science assessment of how hurricane activity is **projected to change in the Atlantic basin in coming decades**, and **why it has been difficult to detect a clear greenhouse warming-driven signal** in past Atlantic hurricane activity. The panelists highlighted where there are gaps in climate data, how those gaps hinder resilience planning, and what actions are needed to address those gaps. This included recommendations that advanced planning and capital investment are needed to help communities break the destruction cycle. For example, it was noted that investment in flood control infrastructure in Louisiana could have mitigated the damage caused by Hurricane Katrina. After it was put in place, it helped protect the same area when Hurricane Ida struck in 2021. The panelists described the need to incorporate social science and economic data into catastrophe and climate models to better assess risk at the community-level. They also stated the need for greater investment in increasing modeling statistical power to better evaluate risks from major events.

Moderator

Steven Bowen, Managing Director and Head of **Catastrophe Insight**, Aon

Panelists

Adam Sobel, Professor, Columbia University
Sarah Kapnick, Senior Climate Scientist and Sustainability Strategist, JP Morgan Chase & Co.
Kelly Hereid, Director, Catastrophe Research & Development, Liberty Mutual Insurance
Thomas Knutson, Senior Scientist, NOAA Geophysical Fluid Dynamics Laboratory

Panel Community Impacts of Climate Change:

Are local government finances ready for what is coming?

This panel highlighted the interconnectedness between the identification and pricing of climate risks and what options are feasible for local governments to prepare for climate change. The discussion included what actions are needed by governments and communities to absorb financial impacts particularly on key sources of municipal funding, such as bond prices and property taxes, and to identify the coordinated actions needed to mitigate the potential impacts by strengthening resilience.

The panelists discussed the inherent challenges associated with planning at the local level based on the changing climate. They discussed how revenues and expenditures can change in localities in response to extreme events based on differences in state laws, type of climate disruptions and other factors that are unique to local communities. These factors mean that different approaches are necessary to help communities address various stresses that will change over time, particularly when it comes to land use and building infrastructure. Panelists stated that climate risk should be incorporated into local budgeting decisions but also acknowledged that many investments which are needed in order to respond to climate change are too costly for local governments. In addition, while municipal bond markets have not been impacted substantially yet, bond ratings, interest rates and pricing may all see changes from these risks in the future, which could affect the ability for local governments to fund projects and services.

Moderator

Pamela Williams, Executive Director, **BuildStrong Coalition**

Panelists

Emily Robare, Head of **ESG for Municipal Bonds**, PIMCO
Carolyn Kousky, Executive Director, Wharton Risk Center, University of Pennsylvania
Mark Osler, **NOAA Senior Advisor for Coastal Inundation and Resilience**
Serena Sowers, VP, **Public Sector Solutions**, Swiss RE

NOAA Climate Experts Panel

This panel showcased some key NOAA science and capabilities that can be used to assist the insurance and finance industries in decision-making. NOAA experts spoke about improvements that are needed in data collection and analysis. They discussed how observation and forecasting advancements have enabled us to **reliably attribute human influence on climate**. Specific examples were provided on advancements in using satellite observations for fire weather forecasting and the understanding of how climate change will increase conditions favorable for severe thunderstorm activity. The panelists then provided some recommendations on activities that will provide immediate benefit such as improving data accessibility by putting all datasets in the cloud, increasing high performance computing capabilities, and supporting researchers who can develop experimental products that are helpful with different users and stakeholders (e.g., insurance and finance community).

The panelists then identified some areas to focus on including:

- furthering our **understanding of physical processes** at the interface between **land**, **ocean** and atmosphere that affect precipitation and other extreme weather events;
- enhancing our collaborations with non-governmental information users (e.g., **Earth Prediction Innovation Center**);
- understanding how past patterns in severe weather can improve our future predictions such as **Attribution and Predictability Assessments**; and
- creating a **climate conservation corps** of people trained to provide resilience information to local communities and facilitate action on the information to better protect lives and their economies.

Moderator

Craig McLean, NOAA Assistant Administrator for Oceanic and Atmospheric Research

Panelists

Ko Barrett, NOAA Senior Advisor for Climate
Harold Brooks, Senior Scientist, **NOAA National Severe Storm Laboratory**
David DeWitt, Director, NOAA Climate Prediction Center
Jennifer Mahoney, Director, NOAA Global Systems Laboratory